

5-1 GENERAL: Units will not construct obstacles that are inherently dangerous. Additionally, no fighting position or other excavation will be used if it is determined that the position is unsafe.

5-2 PURPOSE: To describe the procedures used to perform actual engineer tasks at CMTC. This chapter covers the emplacement and use of obstacles, SCATMINES, demolitions, breaching, and survivability. It explains how these areas are incorporated into the CMTC battlefield.

5-3 ADMINISTRATIVE:

a. GENERAL:

1. Engineer units supporting a maneuver Task Force (TF) rotation are restricted to the MTOE authorized number of personnel and equipment based on the approved troop list.

2. Units must coordinate any augmentation over the approved troop list with OPSGRP, CMTC S-3 IAW USAREUR REG 350-50.

b. LIGHT ROTATION: Light, airborne, air assault, and light/heavy TFs are normally supported by a light, airborne or air assault engineer platoon.

c. HEAVY ROTATION: Task Forces are normally supported by a divisional mechanized engineer company. BCTs are normally supported by a divisional mechanized engineer battalion.

d. CLASS V REQUISITION: All Class V (mines and demolitions), to include training aids issued by CMTC, must be requested using a DA Form 581 and issued on a DA Form 5515 through the TF and brigade supplies system.

e. RESTRICTIONS: All material for obstacles and survivability positions must come from the Class IV/V channels. Units will not use, move, or disturb, in any way logs, trees, boulders, or battlefield clutter (target vehicles and destroyed cars) in the exercise area. The only exception is the use of destroyed cars in MOUT sites when authorized by EXCON.

f. ALLOCATION OF MINES: Concrete training mines issued to the player unit by CMTC replicate conventional mines. Each BLUFOR TF will receive a mine allocation based on guidance found in the base operations order.

g. DES DISTRIBUTION:

1. Completed DES is issued to either the Engineer Battalion S-4 or the maneuver Brigade S-4.

2. Rotational units requisition simulators through their CSS channels using DA Form 581.

3. Live DES devices are issued to the using unit with blasting caps, and are treated as authentic demolitions.

h. BLUFOR DES RESPONSIBILITIES:

1. Prior to CMTC rotation, complete all engineer squad demolitions training IAW UR 350-1, section IV. Ensure all quarterly and annual training was also completed.

2. Turn-in roster of certified firers to TF or BDE Engineer O/C Team.

3. Build DES simulators and package in ammunition crates.

4. Transport completed DES items to using units.

5. Ensure security and accountability of all DES items.

6. Issue simulators to TF units.

7. Turn-in all unused simulators at End of the Rotation (EOR) to Engineer Battalion S-4 or the Brigade S-4.

5-4 COUNTERMOBILITY OPERATIONS:

a. REPORTING REQUIREMENT: All BLUFOR units will report all minefields to the TF engineer O/C using DA Form 1355. The report must include:

1. The type of obstacle.
2. Composition.
3. Eight digit grid coordinates of all four corners.
4. The number and type of mines if any.

b. REPORT POINT OBSTACLES WITH:

1. Eight-digit center of mass grid coordinate.
2. Obstacle composition and orientation.

c. REPORT OBSTACLES IN MOUT SITES: Report for mines or booby traps located in buildings will include building number, floor and specific location (i.e. behind door first floor front entrance building #6).

d. CONVENTIONAL OBSTACLES:

1. Obstacles will be recovered IAW Chapter 1, para 1-9, POST BATTLE FIELD RESTORATION.

2. All conventional minefields (BLUFOR and OPFOR) and mines not recovered, to include "dirty battlefield" obstacles, remain in effect throughout the exercise, or until recovered by the emplacing unit.

3. Mines must be recovered IAW FM 20-32. (except during directed Post Mission Battle Field Restoration).

4. Units will not construct obstacles or fratricide fences that are inherently dangerous and have little tactical value (e.g. head high, single strand barbed wire.)

e. **OBSTACLES TIED INTO OFF-LIMITS AREAS:** Obstacles cannot be "tied in" to off-limits (Seibert Staked) areas to achieve artificial effects. All obstacles must tie into the natural terrain.

1. For hand-emplaced obstacles, units can construct the obstacle through the off-limits area, or replicate obstacle construction by placing sufficient type and quantity of barrier material at the point where the off-limits area begins.

2. The emplacing unit will wait the required time to complete the obstacle, as determined by their O/C.

3. For obstacles that require mechanical assets to construct the equipment must wait the appropriate time to complete the obstacle.

4. If the materials and time are not accounted for, a lane will be created at the point where the obstacle meets the off-limits area to simulate a bypass around the obstacle.

f. **USE OF VEHICLES AS OBSTACLES:** Tactical vehicles may not be used as obstacles. Only if authorized by EXCON may junk vehicles be used as obstacles in MOUT sites.

g. **EMPLACING MINES:**
1. Mines may be buried, camouflaged, or surface-laid. Units will report all minefields IAW para 5-5a of the CMTC EXROE.
(a) DA FM 1355 must be completed for all minefields with buried mines. The 1355 must be given to the O/C for verification. If the unit does not complete DA FM 1355 and have an O/C verify, the minefield may not receive the desired effects.

(b) Mines with tilt rods must be buried or staked IAW FM 20-32. Failure to do so will result in mines not receiving effects.

2. Placing a white sticky label on the top of the mine replicates arming and fusing of BLUFOR mines. The label must have the DTG, the emplacing soldier's unit, and his/her initials.

3. A 2" Styrofoam square placed underneath the M15 anti-tank training mine replicates anti-lift devices. Units must replicate

the additional time per anti-tank mine necessary to emplace each AHD (IAW FM 20-32).

4. The use of anti-handling devices and booby traps is allowed at CMTC provided the Class V is properly requested and on hand and the correct procedures are used IAW the appropriate FM or TM.

h. **EMPLACING WIRE OBSTACLES:**
Units will not construct any single strand barbed-wire or unmarked cattle fence obstacles.

i. **EMPLACING OBSTACLES:**
1. Units may construct obstacles (wire/picket, log, tetrahedral barriers, Dragon Teeth or tank ditch obstacle) that can physically block roads and trails using materials issued through the Class IV/V supply system and are in accordance with paragraph 5-5.e. Excavation, use of berms or earthen obstacles is not authorized on tank trails or within 5 meters of tank trails.

2. If a unit wishes to emplace a tank ditch, berm, or other physical obstacle across a tank trail but cannot due to EXROE constraints:

(a) Replicate construction of the obstacle by positioning the required equipment and/or materials at the site and wait the appropriate amount of time to "complete" the obstacle.

(b) Indicate completion with a single strand of concertina wire hooked (not tied) to pickets on each side of the lane. The single strand of concertina wire will have a single piece of white engineer tape threaded through the top of the wire to mark the continuation of the obstacle. Illuminated night markings are not required.

j. **EMPLOYING ROAD CRATERS:**
1. Units can create simulated road craters using DES shaped and cratering charges, or with assigned mechanical sets, where digging is permitted. An OC must verify the calculations done by the unit to ensure the proper number of charges are used. The unit will emplace the charges IAW FM 5-250 or FM 5-34. The unit will detonate one DES charge for the shaped charge and one DES charge for the cratering charge.

2. If using DES or emplacing on a tank trail or road, mark the perimeter of the crater with a single row of concertina wire marked with engineer tape once executed. A tripod of three U-shaped pickets wrapped in engineer tape marks the center of the crater.

k. **OBSTACLES IN MOUT:** Units may place obstacles on any trail or road (see

paragraph 5-5i if excavation is required) within the MOUT sites. Tunnels will not be obstructed. Units may place wire obstacles on top of existing structures, and only wire obstacles to block the sewer entrance.

1. Existing buildings and structures may not be altered or damaged to create obstacles.

2. Civilian (junk) automobiles located in MOUT site may be relocated and used as obstacles if approved in advance by EXCON. Tactical vehicles may not be used as obstacles.

3. Units defending the MOUT sites will establish a safety lane for real world medical evacuation.

4. Obstacle Reporting:
Defending units must report all obstacles and booby traps in and around MOUT Sites. Defending units must also physically show objective O/Cs all obstacles prior to NLT Defend Time.

5. Units may dig in MOUT Sites, only with prior approval from the CMTC DPW.

I. ASSESSING BDA AND CASUALTIES FOR CONVENTIONAL MINES:

1. BLUFOR and OPFOR mines placed less than 4m apart are subject to sympathetic detonation.

2. Mishandling (throwing, kicking, dropping) or disturbing an armed anti-tank training mine (M15, M21, TM 62M) will result in casualties to exposed personnel within the radius specified in the FM 20-32 or 5-34.

5-5 SCATMINES:

a. GENERAL:

1. BLUFOR and OPFOR Scatterable Mines (SCATMINES): SCATMINES include all artillery delivered SCATMINE munitions, ground emplaced SCATMINES, and air delivered SCATMINES.

2. The minimum IS dimension of tactical SCATMINE minefields is 200 x 200 meters.

3. Report intention and request for planning of any anticipated SCATMINE minefields through the Brigade Engineer to EXCON at a minimum of 30 minutes prior to planned emplacement of the FASCAM. This will allow firemarkers and O/Cs to position themselves to mark and adjudicate the FASCAM.

4. A SCATMINEWARN will be sent 30 minutes prior to execution of a SCATMINE minefield.

5. Depending on the type and number of munitions, SCATMINES minefields can be LOW, MEDIUM, or HIGH density.

6. All SCATMINES will self-destruct when they reach their expiration time, based on when they were emplaced unless otherwise directed by COM instructions.

b. ARTILLERY DELIVERED ADAM/RAAM:

1. The duration of a ADAM/RAAM minefields are either 4 or 48 hour duration.

2. The standard artillery delivered minefield is a short duration, medium density, 400mx400m meter square. Units are not limited to the standard duration/ density. Units may fire one 200mx200m, 200mx400m, 400mx400m or 200mx800m ADAM/RAAM only.

3. Inaccurately or improperly executed ADAM/RAAM minefields are emplaced as fired.

4. Exposed personnel and vehicles located in the safety zone or footprint of the minefield while it is being fired may be assessed as casualties.

c. MARKING ARTILLERY SCATMINE:

Fire markers will mark artillery delivered minefields with:

1. 5 air burst artillery simulators and 1 yellow smoke when they receive 'shot' from the firing battery.

2. Yellow Pickets on the corners and two Yellow Pickets, 1 meter apart, at the center of the minefield.

3. Training mines will be placed on tank trails leading into the minefield, within the capability of the Firemarker or O/C.

4. An additional yellow smoke and hand grenade simulator will be thrown when the first vehicle enters the minefield and is assessed as a casualty. For subsequent vehicles, only a hand grenade simulator will be thrown.

d. VOLCANO SCATTERABLE MINEFIELDS:

1. Allocation of Volcano loads is determined through Division Operations Orders.

2. The minimum dimension of a SAWE supported ground emplaced VOLCANO minefield is 200 x 200 meters.

3. All components of the VOLCANO system must be on hand and operational to emplace a minefield IAW TM 9-1095-208-23-1&P.

4. With an O/C present and observing, the unit must turn the system on and

drive the center line(s) of the minefield IAW the procedures outlined in FM 20-32.

(a) Ground VOLCANO minefields will receive minimal effects along the centerline. This traveled pathway will be adjudicated by the covering O/C.

(b) Units cannot use the centerline as a true, cleared path for vehicle travel unless they execute breaching, proofing and marking operations along the path.

5. There is no requirement for the VOLCANO system to actually launch training mines.

6. MARKING VOLCANO

MINEFIELDS: Observer/controllers mark VOLCANO minefields by initiating a hand grenade simulator and a yellow smoke grenade at the start of the center line and the end of the center line as the VOLCANO system executes the minefield.

(a) The TC of the emplacing vehicle raises a red flag to signal the start of the execution (system deploying mines), and keeps it raised until the end of execution when he lowers it (system off, minefield complete).

(b) The emplacing unit marks the minefield with aiming stakes/yellow pickets and training SCATMINES at each corner.

(c) The unit must report in writing, an eight digit grid coordinate for each corner and start/end point of the center line (s) of the minefield to the TF engineer O/C.

(d) They will also place training SCATMINES on all trails entering the minefield.

7. ASSESSING BDA IN A

VOLCANO OR MOPMS MINEFIELD: When the first vehicle enters a VOLCANO or MOPMS minefield, the overwatching O/C or fire marker will:

(a) Initiate a yellow smoke grenade and a hand grenade simulator as the first vehicle enters the minefield and assess casualties.

(b) Hand Grenade simulators denote all subsequent kills as additional vehicles enter the minefield.

e. AIR DELIVERED VOLCANO

MINEFIELDS: See Chapter 7, Aviation, Paragraph 7-11.

f. MOPMS SCATTERABLE

MINEFIELDS:

1. All necessary components (CMTC MOPMS trainer, M71 firing device [RCU] or blasting machine, and batteries) of the MOPMS must be on hand and operational to emplace a MOPMS minefield.

2. Prior to X-1 the training unit will conduct a system function check with each RCU or blasting machine and the M-136 trainer to an O/C to ensure the system is fully operational. At this time, the O/C will affix a tag to the MOPMS box. Only MOPMS boxes with O/C tags will be considered operational.

3. At the time of emplacement, with an O/C present and observing, the unit must demonstrate proper employment procedures for the RCU or blasting machine IAW TM 9-1345-208-10-1. As the minefield is activated, the O/C will initiate one hand grenade simulator and a yellow smoke. MOPMS boxes will be reconstituted IAW normal ammunition requisitioning procedures as outlined in Chapter 8, para 8-6 of the EXROE, at which time the O/C will attach a clean tag.

4. MOPMS minefields have a duration of 4 hours and are low density. When the RCU is used the minefield can be recycled up to three times for a total duration of 12 hours and can be command detonated. Arming time is 90 seconds. The footprint of a single MOPMS minefield is a 180 degree semi-circle with a 35 meter radius.

5. The unit must report an eight digit grid coordinate for center of the minefield safety zone (55m front, 20m rear, 50m sides) and the location of each CMTC MOPMS trainer to the TF engineer O/C.

6. The emplacing unit will mark the minefield by placing 21 SCATMINE training mines randomly in the 35 m arc replicating the dispersion pattern.

7. Units may "hard wire" activate the MOPMS with an M32, M34, or M57 blasting machine and commo or demo wire. Standoff distance from the MOPMS when activating the system by "hard wire" is 100 meters in a hardened vehicle or bunker. O/Cs will assess casualties due to the possibility of fragmentation injury as detailed in FM 5-250. Additional casualties will be assessed if vehicles or personnel remain within the safety box after the mines arming sequence is completed IAW FM 25-50. The maximum range of each blasting machine is IAW FM 20-32.

8. Units may receive SAWE adjudication of MOPMS minefields emplaced as tactical obstacles if they:

(a) Emplace the MOPMS minefields as tactical minefields IAW FM 20-32 and achieve a minimum of 200m frontage and 115m of depth.

(b) MOPMS minefields built in SAWE have a duration of 4 hours, but may be recycled if employed with the RCU.

g. MARKING SCATMINE EXPIRATION:

Fire Markers or O/Cs will initiate a green smoke grenade and three hand grenade simulators to mark the self-destruction of all (BLUFOR and OPFOR) scatterable minefields.

5-6 MOBILITY OPERATIONS:

a. GENERAL:

1. The successful reduction of lanes in obstacles is based on the type of breaching asset used to reduce the obstacle. The O/C observing the operation will determine the actual effects.

2. If the breaching unit uses line charges, bangalore torpedoes, hand-emplaced explosives, or other approved techniques, the BLUFOR/OPFOR unit conducting the operation will remove enough of the obstacle to make the required lane under O/C supervision.

b. BREACH CAPABILITIES OF

BLUFOR: Listed in Table 5-2 and 5-3.

c. DES HAND EMPLACED

EXPLOSIVES FOR CONVENTIONAL MINES:

Units must place and detonate a charge next to each mine in the intended lane to effect a breach.

d. MICLIC:

1. All components must be on hand and operational both electronically and mechanically IAW TM 9-1375-215-13&P.

2. Prior to mission execution, the engineer unit must demonstrate to the engineer O/C that the MICLIC is fully functional.

3. The MICLIC must be employed IAW procedures outlined in FM 20-32.

4. Ten seconds after the arm raises, the O/C detonates a grenade simulator that simulates the rocket firing.

5. Ten seconds later or in conjunction with the operating unit's firing command, a second grenade simulator is detonated simulating the line charge exploding.

6. Immediately following the detonation, the unit clears all mines along the "direct line" of the MICLIC (14m x 100m).

7. The unit clears any wire obstacle breached by the line charge.

e. ASSESSING BDA AND CASUALTIES FOR MICLIC:

1. Casualties may be assessed on unprotected and exposed personnel (dismounts, personnel in soft skin vehicles, TC's in hatches, etc.) within 200 meters to the rear,

800 meters to the sides, and 400 meters to the front of the MICLIC launching platform.

2. One proofing asset (tank with roller/plow, ACE) may be directly in front (1 meter) of the vehicle towing or carrying the MICLIC without becoming a kill (IAW FM 3-34.2).

3. Proofing should always be planned for a breaching operation. However, the time available, the threat, or the mission may dictate that proofing not be done. Conditions for this decision must be addressed in the commander's tactical risk assessment or casualties may be assessed.

f. CLEARING LANES WITH A MINE

CLEARING BLADE: All components of MCB must be on hand and operational IAW applicable TMs, FMs and safety messages.

1. Units must maintain appropriate spoil on the blade i.e. (up to the top of the moldboards)

2. Plows will only be set at the 8" depth setting.

3. Crews will maintain the gun tube to the side or rear.

4. A grenade simulator will signify each mine encounter.

5. To plow on an improved tank trail the crew must:

(a) Lower the plow and then raise the plow to indicate the start and end point.

(b) Drive straight and no more than 5 mph until through the obstacle.

(c) O/C directed pause for two minutes to simulate raising the plow.

6. The plow will be destroyed after it encounters five mines.

7. On the sixth mine, the tank will be assessed as a catastrophic kill.

8. The covering O/C will adjudicate IAW FM 20-32.

g. EMPLOYING THE MINE ROLLER: If units use rollers to detect, proof or reduce minefields the following applies:

1. Each roller bank will be destroyed after it encounters three mines.

2. On the fourth mine, the tank will be assessed as a catastrophic kill.

3. The covering O/C will adjudicate IAW FM 20-32.

h. USE OF ACE OR D7 TO REDUCE OR PROOF A LANE:

Skimming with a blade asset (ACE or Dozer) is considered a high risk operation that units can use to reduce lanes in anti-personnel minefields only.

1. Dozers must be sandbagged to protect the operator (IAW FM 20-32).

2. The blade asset must make multiple, overlapping passes of no more than 15 meters, using a herringbone technique as described in FM 3-34.2.

i. REDUCING ROAD CRATERS AND ANTI-TANK DITCHES:

1. BLUFOR Units may reduce or breach Road Craters (RCs) or Anti-Tank Ditches (ATDs) using a blade asset or tactical bridge.

(a) Blade assets either physically reduce the obstacle, or if the obstacle is on an existing Tank Trail, move to the edge of the obstacle and replicate reduction by continuously moving forward and backward for five minutes.

(b) The AVL B must actually place the bridge across the simulated or actual gap.

2. OPFOR units may reduce or breach Road Craters (RCs) or Anti-Tank Ditches (ATDs) using a blade asset, tactical bridge or T-80 tanks with self-entrenching capability.

(a) Blade assets and tactical bridging work in the same manner as BLUFOR assets (para 5-7 i (1)).

(b) T-80 tanks move to the edge of the obstacle and replicate reduction by continuously moving forward and backward for ten minutes.

j. REDUCING A OBSTACLE WITH DIRECT FIRES: Breaching obstacles with direct fire weapons is not allowed by CMTC.

k. PUSH THROUGH METHOD: Units may use the push through method to reduce lanes in Conventional MFs and Scatterable MFs. Units must use the proper procedures or the pushing vehicle is killed and personnel in the vehicle become casualties.

1. Vehicles will move at no more than 5 mph in a straight line (no turning/changing direction).

2. Vehicles will maintain a minimum distance of one (1) meter for safety purposes.

3. The pushing vehicle must be of the same vehicle type as the pushed vehicle.

4. The pushing vehicle must have its gun tube to the side or rear.

5. Vehicles may not be pushed uphill through a minefield.

6. If a roller, plow, or blade asset is reducing a lane in an obstacle and becomes disabled due to direct or in-direct fire, it cannot be pushed through a minefield.

5-7 SURVIVABILITY OPERATIONS:

a. **NO DIG AREAS:** Each unit receives a “no dig” overlay prior to each rotation. Units will strictly observe all restrictions marked on the overlay.

1. No excavations, by hand or with mechanical assets, will be within five meters of a tree.

2. Improved tank trails will not be cut or excavated for any reason. Units can dig no closer than 10 meters to the shoulder of an improved tank trail.

b. **REPORTING REQUIREMENTS:** Units will record an eight-digit grid coordinate to all man-made excavations and report location grids to the TF engineer O/C.

c. **FIGHTING POSITIONS AND OTHER EXCAVATIONS:** Vehicle and individual fighting positions will be constructed IAW the appropriate FM. Units will not be allowed to occupy a fighting position deemed unsafe. Improperly constructed fighting positions and other excavations that would not provide adequate protection will result in O/C adjudication of elements occupying the position if engaged.

d. **MOUT RESTRICTIONS:** Units will not dig in or within 10 meters of MOUT sites without prior approval of the CMTC DPW.

5-8 TRAINING DEMOLITION:

a. **GENERAL:** Demolition Effects Simulators (DES) replicate all demolitions. There are no notional demolitions used at CMTC.

b. **REPLICATION FOR DES:** DES is made up of cardboard, filled with sand, chalk, and the detonation cord. It is exploded by using a non-electrical blasting cap, time fuse, and an igniter. Simulators replicate the Bangalore Torpedo, TNT Block, Shape and 40-pound Cratering Charge.

c. DES SAFETY:

1. Training units will adhere to procedures for the safe handling/transportation of training ammunition/pyrotechnics IAW AR 75-1.

2. DES explosions may throw dirt or debris. Units carrying out operations will observe the same safety distances as if they were detonating actual devices.

3. If unexploded DES devices are found, mark the site and notify an O/C immediately.

4. Misfire of an MDI initiating system. All Modern Demolition Initiators (MDI)

components must be treated with the same respect and care as taken with any other types of military explosives.

d. **POSITIVE CONTROL OF BLASTING CAPS:** Blasting caps and MDI are maintained under the strict control of qualified personnel. Qualified personnel are:

1. CMTC O/Cs
2. Soldiers that are annotated on the Task Force or Engineer Battalion Commander's certification memo for demolition-qualified.

e. **ISSUING BLASTING CAPS AND MDI:**

1. Once the player has correctly emplaced the DES, the individual maintaining control of the blasting caps will issue a blasting cap for detonation.
2. The same wartime minimum safe distances are used for the simulators as are used for the equivalent actual demolitions.

f. **COLLECTION AND DISPOSAL OF MDI RESIDUE:**

1. Store all MDI components in their original packaging until needed for use. All

MDI components must be treated with the same respect and care as taken with any other explosives.

2. After detonation, the expended shock tube must be gathered and disposed of IAW ASP 2 guidelines.

3. Expended blasting caps must be cut off the expended shock tube and disposed of in a controlled or hazard landfill.

4. The expended shock tube must be bagged and can either be burned in a facility that has an approved incinerator for burning plastics or disposed of in a landfill.

5. All MDI residue must be policed by the emplacing unit NLT change of mission +1 and reported to the Senior Engineer NCO O/C (M15D/G15D/T15D/ W15D).

TABLE 5-1: PUSH THROUGH BDA

| Minefield Density | Maximum Vehicle Attrition | Push Through Losses |
|-------------------|---------------------------|---------------------|
| LOW | 5 | 2 |
| MEDIUM | 10 | 4 |
| HIGH | 20 | 8 |

| TABLE 5-2: BLUFOR BREACHING ASSESTS | | | |
|-------------------------------------|-----------------------------------|---|--|
| BREACH ASSET | OBSTACLE TYPE | EFFECT | REMARKS |
| TNT/C-4, | Conventional MF Scatterable MF | For scatterable MFs, one charge per 5 meters of depth | O/C determines based on # of mines/charges |
| Bangalore Torpedo | Wire & Conventional MF | O/C determines IAW FM 5-250 | |
| MICLIC | Wire All Mine Fields | 14 m X 100 m path in the direction the rocket is pointing | Refer to paragraph 5-7 g. (3) |
| Shape/ Crater Charge | Road Block | O/C determines, IAW FM 5-250 | |
| Mine Clearing Rollers | Conventional MF | 3 mines per side disables system. | |
| | ARTY SCATMINE | 200 M | |
| | UMZ | 120 M | |
| Mine Clearing Blade | Conventional MF | 3 mines per side disables system | |
| | ARTY SCATMINE | 400 M | |
| | UMZ | 120 M | |
| Skimming w/ ACE, Dozer | Conventional AP MF | O/C determines IAW FM 3-34.2 | O/C determines if IAW FM 3-34.2 |
| | Scatterable AP MF | | |
| Vehicle Push Through | All Minefields | O/C determines if IAW ROE | |
| AVLB, | RC, ATD | Actual Effect | |
| Blade Asset | RC, ATD | Actual effect or 5 minute delay | |

* MOPMS employed as a fix obstacle IAW Paragraph 5-6.f.(8) is equivalent to Volcano obstacles for adjudication of breach effects.